

WHAT IS CLAIMED IS:

1. A magnetic rotation detector comprising:

a magnetic rotor having magnetic bodies  
disposed on an outer periphery portion thereof at  
5 intervals of a predetermined distance;

a detecting body that detects a change in  
magnetic flux that is caused by the magnetic bodies as  
the magnetic rotor rotates; and

an abnormality determination portion that  
10 monitors an apparent fluctuation in rotational speed of  
the magnetic rotor based on a result detected by the  
detecting body and that determines that the magnetic  
rotor is in an abnormal state if the fluctuation occurs  
at a specific position of the magnetic rotor.

15 2. The magnetic rotation detector according to claim 1,  
wherein

the abnormality determination portion detects the  
occurrence of the fluctuation at the specific position of  
20 the magnetic rotor by making a determination on a  
distance between apparent positions of the magnetic  
bodies which correspond to the apparent fluctuation in  
rotational speed.

25 3. The magnetic rotation detector according to claim 2,  
wherein

the abnormality determination portion calculates the  
distance on the basis of a product of an interval of  
generation of noise in an output signal detected by the  
30 detecting body and a rotational speed of the magnetic  
rotor at the time of generation of noise.

4. The magnetic rotation detector according to claim 1,  
wherein

the abnormality determination portion determines  
that the magnetic rotor is abnormal if the apparent  
5 fluctuation in rotational speed at the specific position  
lasts for a predetermined period or more.

5. The magnetic rotation detector according to claim 1,  
wherein

10 the abnormality determination portion determines  
that there is the apparent fluctuation in rotational  
speed if an absolute value of a derivative value of a  
rotational speed of the magnetic rotor exceeds a  
predetermined value.

15 6. The magnetic rotation detector according to claim 1,  
wherein

the abnormality determination portion estimates that  
the fluctuation in rotational speed at the specific  
20 position is an abnormality resulting from adhesion of  
metal fragments to the magnetic rotor.

7. The magnetic rotation detector according to claim 1,  
wherein

25 the abnormality determination portion does not  
determine that the magnetic rotor is in an abnormal state  
even if the fluctuation occurs at the specific position  
of the magnetic rotor, as long as the magnetic rotor  
rotates at a rotational speed lower than a predetermined  
30 value.

8. A vehicle control apparatus comprising:

a plurality of wheel speed detectors, each of which detect a wheel speed of a corresponding wheel by means of the magnetic rotation detector according to claim 1; and

5 a rough road determination portion that makes a determination on a rough road state of a road surface on the basis of the wheel speeds respectively measured by the wheel speed detectors,

wherein the rough road determination portion makes a determination on a rough road with a reduced degree of reflection of the wheel speeds detected using the  
10 magnetic rotation detector regarded as abnormal if the abnormality determination portion determines that the magnetic rotor is in an abnormal state.

15 9. The vehicle control apparatus according to claim 8, wherein

the rough road determination portion makes a determination on a rough road after excluding the wheel speed detected using the magnetic rotation detector  
20 regarded as abnormal, if the abnormality determination portion determines that the magnetic rotor is in an abnormal state.

10. A vehicle control apparatus comprising:

25 a plurality of wheel speed detectors, each of which detect a wheel speed of a corresponding wheel by means of the magnetic rotation detector according to claim 1; and

a vehicle speed determination portion that estimates a vehicle speed on the basis of the wheel speeds  
30 respectively measured by the wheel speed detectors,

wherein the vehicle speed determination portion estimates a vehicle speed with a reduced degree of

reflection of the wheel speeds detected using the magnetic rotation detector regarded as abnormal, if the abnormality determination portion determines that the magnetic rotor is in an abnormal state.

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11. The vehicle control apparatus according to claim 10, wherein

the vehicle speed determination portion estimates a vehicle speed after excluding the wheel speed detected using the magnetic rotation detector regarded as an abnormal, if the abnormality determination portion determines that the magnetic rotor is in an abnormal state.

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12. A vehicle control apparatus comprising:

a wheel speed detector employing the magnetic rotation detector according to claim 1; and

a vehicle control portion that controls the behavior of a vehicle on the basis of a wheel speed measured by the wheel speed detector,

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wherein the vehicle control portion inhibits vehicle control from being positively performed if the abnormality determination portion determines that the magnetic rotor is in an abnormal state.

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13. A method of making a determination on an abnormality in a magnetic rotor having magnetic bodies that are disposed on an outer periphery portion thereof at intervals of a predetermined distance, comprising:

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detecting a change in magnetic flux that is caused by the magnetic bodies as the magnetic rotor rotates;

monitoring an apparent fluctuation in rotational speed of the magnetic rotor on the basis of the detected change in magnetic flux;

5 determining whether the fluctuation in rotational speed occurs at a specific position of the magnetic rotor; and

determining that the magnetic rotor is in an abnormal state if it is determined that the fluctuation in rotational speed occurs at the specific position of  
10 the magnetic rotor.